Application Number 10/687,989
Amendment dated March 25, 2008
Response to Office Action mailed December 27, 2007

AMENDMENTS TO THE SPECIFICATION

On pages 8, 10, 12, 14, please replace paragraph [0034], [0041], [0051], and [0057] with the following respective paragraphs:

[0034] In accordance with the principles of the invention, an operational mode, referred to as a "prefix limit mode," is therefore provided and described herein to prevent such failures. This operational mode limits the number of prefixes that may be leaked from an exterior routing protocol to an interior routing protocol. The operation mode may be provided by any router, for example one of customer routers 10A, 14A and 18A, that receives routes via an exterior routing protocol and leaks or otherwise exports the routes to an interior routing protocol. For exemplary purposes, the techniques are described in reference to customer router 10A. Moreover, although illustrated herein with reference to limiting routes exported from an exterior routing protocol to an interior routing protocol, the techniques are not so limited. In particular, the techniques may be applied to limit the exportation of routes to an interior routing protocol from an exterior routing protocol, an interior routing protocol, or combinations thereof~~therof~~.

[0041] Routing protocols 32A-32N (collectively "routing protocols 32") represent various protocols by which router 10A exchanges routing information 36 with other routing devices, such as provider router 6B, or customer routers 10B and 10C, thus learning the available routes through the service provider network 4 and customer network 8A. Routing protocols 32 may include interior routing protocols, e.g. ISIS 32N and OSPF 32B, to exchange routing information with customer routers 10B and 10C, for example, that are also internal to customer 8A, for example. In addition, routing protocols 32 may include exterior routing protocols e.g., BGP 32A, to exchange routing information with devices residing within external networks, such as provider routers 6A-6D of service provider network 4.
0

[0051] Similarly, a prefix limit of 5,000 routes has been set for a level two (L2) instance 49B of the ISIS routing protocol, and currently only 2343 routes have been exported from an exterior routing protocol to the L2 instance 49B. A prefix limit of 5,000 routes has also been set for a first instance 49C[[54]] of the OSPF routing protocol. A total of 4,093 routes have been exported from an exterior routing protocol to the first instance 49C of the OSPF protocol.

-2-

[0057] However, if the value contained in the updated one of prefix counters 48 exceeds the specified prefix limit, customer router 10A transitions to an overload condition (220). In other words, exceeding a defined prefix limit causes control unit 42 to assume that a peer device, e.g., provider router 6A, is improperly communicating an excessive number of routes into customer router 10A via an external routing protocol. Control unit 42, therefore, assumes that any routes learned from an exterior protocol are invalid. Thus, control unit 42 clears, e.g., prunes, all of route data learned from any exterior routing protocols from routing information 36 (222). In addition, control unit 42 rebuilds all of the interior routes of routing information 36 and associates with each route a maximum metric, which can be viewed as the effective "distance" between customer router 10A and the other interior customer routers 10B and 10C of customer network 8A along the particular route (224). Alternatively, control unit 42 may set an overload bit within link state prefixes associated with the routes, depending upon the particular interior protocol. Control unit 42 advertises the updated routing information 36. By setting the interior routes to a maximum metric or by setting the overload bit, other internal customer routers 10B and 10C of customer network 8A will effectively avoid customer router 10A and will seek to find other routes through the network. As a result, customer router 10A is essentially removed from customer network 8A, and a potential system failure may be avoided.

-3-